

# DRUMMING: A virtuoso performance

- SARABJEET KAUR

*“In an attempt to impress  
I choose a tree of prime quality  
To blow pecks in a regulated pace, a vibrating rhythm  
After all, I am looking for a mate  
O! Humm-Drumm! Do you hear me?”*

Recently, many around the campus have been drawn to a particular raucous sound, wondering, “What is that sound?” and “Who is emitting it?”. This sound, intriguing to many but recognised by only a few, was the drumming of a male Greater Flameback (*Chrysocolaptes guttacristatus*) on the main trunk of a White Siris (*Albizia procera*) tree. This drumming began on March 15<sup>th</sup>, 2024, and continued everyday uninterrupted until April 18<sup>th</sup>, 2024. With careful listening, it can still be heard on select days.

Bird calls are short, single-syllable notes that serve several functional purposes. They can vary in structure and, based on associated behavioural cue, may be categorised as contact calls, flight calls, begging calls, and alarm calls. Accordingly, many of these are heard throughout the year. Bird songs, on the other hand, are more refined and complex. They are usually heard during the breeding season, used in courtship, mating rituals, and for delineating/defending territories.

Drumming, however, is a non-vocal sound. It is similar to the sonations generated by strikes, snaps, claps, and vibrations of feathers, wings, and beaks used for signalling. For instance, the vibrating sound produced by the wings in Rufous-gorgeted Flycatcher (*Ficedula strophiatea*) serves a purpose of territoriality. The clapping of wings (through striking of carpal bones) in Short-eared Owl (*Asio flammeus*) is defensive towards predators and humans, as well as in intraspecific encounters for nest defence. The bill snaps of Shoebill (*Balaeniceps rex*) are used during courtship displays.



A male Greater Flameback (*Chrysocolaptes guttacristatus*) perched on a dead *Shorea robusta* tree

A bird needs to hear its particular song at a certain age, during a 'sensitive phase' in its development, to learn it, even if it possesses an innate ability to discriminate its own species-specific songs. This is because bird songs can be incredibly complex, and may vary from individual to individual. The superb Lyrebird (*Menura novaehollandiae*) of eastern Australia, for instance, has the most complex song known to date. This species is famous for its vocal mimicry, which includes sounds as diverse as a crying human baby, chainsaws and car alarms. They are among several species that continue to learn and acquire new songs throughout most of their lives. Each bird has a variety of songs, and with careful observation, one may discover new calls or songs along the way.



A male Fulvous-breasted Woodpecker (*Dendrocopos macei*) blowing pecks on the secondary branch of a (*Bombax ceiba*) tree

Drumming is a unique interaction observed in the family Picidae, which includes piculets, wrynecks, sapsuckers, and woodpeckers. These species use drumming – much like songbirds – to advertise their presence, proclaim & defend territories, and attract mates. It's a specialised form of communication used during the breeding season, consisting of a series of pecks hammered on a surface that produce a rhythmic sound and vibration repeatedly.

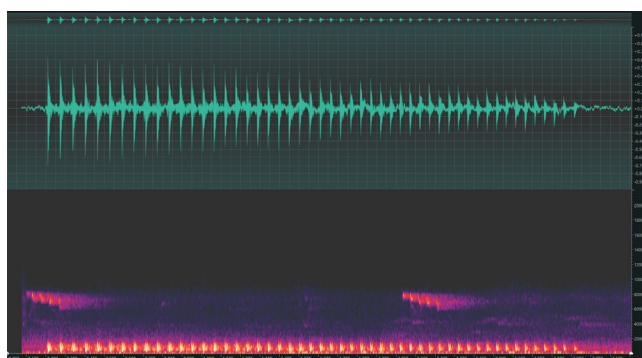
The head and neck of a woodpecker function as a stiff hammer. Each woodpecker species has a unique drumming pattern. Interestingly, one can identify a woodpecker species by measuring the pace of their pecks and knocks, regardless of the substrate used. For example, Downy Woodpeckers (*Picoides pubescens*) drum at a rate of approximately 15 drums per second, Hairy Woodpeckers (*Picoides villosus*) at a rate of approximately 26 drums per second, and Yellow-bellied Sapsuckers (*Sphyrapicus varius*) display variable drumming rates (Source: Macaulay Library, Cornell Lab of Ornithology).

Young woodpeckers learn how to drum by watching and imitating adult woodpeckers. They start out by trying on different surfaces and strengths of pecking, and with practice, they improve their drumming abilities by changing the intensity, rhythm, and duration of their drumming based on the reaction they receive from other woodpeckers.

Interestingly, a special brain area associated with vocal learning in animals and language in humans is activated by drumming in woodpeckers. A marker gene, Parvalbumin (PV), is

present in all cells of the body and expressed in a specialised region of the forebrain in songbirds and humans. This gene helps learn vocalisations during a young age and develop complex muscle movements to control sound production. Schuppe *et al.* (2022) found that PV regions were activated by drumming in woodpeckers rather than when they vocalised.

Anatomically, when a woodpecker's tongue is retracted, it keeps the hyoid muscles relaxed. These muscles hug the skull, which was previously thought to facilitate shock absorption during woodpecker pecking and drumming. However, a study by Van Wassenbergh *et al.* in 2022 analysed high-speed video camera footage and built biomechanical models to conclusively debunk this long held belief popularised in the media, books, zoos, and on several websites. In fact, their calculations demonstrated that any shock absorbance would actually hinder the woodpeckers' pecking abilities. It is simply the woodpecker brain anatomy (small, lighter brains) that increases the threshold for suffering any concussion-related brain damage from its usual pecking/drumming activities.



Greater Flameback drumming discernible in Waveform and Spectrogram View (Ocenaudio)

Our campus' Greater Flameback has finally found a mate after a month-long drumming. Both individuals communicated with each other using the live and dead trees of *Shorea robusta* and the live trees of *Albizia procera* to establish territorial interactions. So, tune in to your surroundings! See if you can identify any woodpecker species other than Greater Flameback drumming lately. If it helps, familiarise yourself with the drumming calls of picids (check out the links below) before you go birding!

- Greater Flameback - <https://macaulaylibrary.org/asset/617423985>
- Grey-capped Pygmy Woodpecker - <https://xeno-canto.org/170088>
- Grey-headed Woodpecker - <https://macaulaylibrary.org/asset/617424214>

### About the Author

As an aspiring ornithologist, Sarabjeet started monitoring birds around her from a very young age. In 2017, she began her doctoral work on the ecology of Great Slaty Woodpecker in Uttarakhand, which helped further her understanding of Picids (or woodpeckers) in general. Since 2023, she has also taken on the voluntary role of an eBird Regional Reviewer for two districts of Uttarakhand.

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